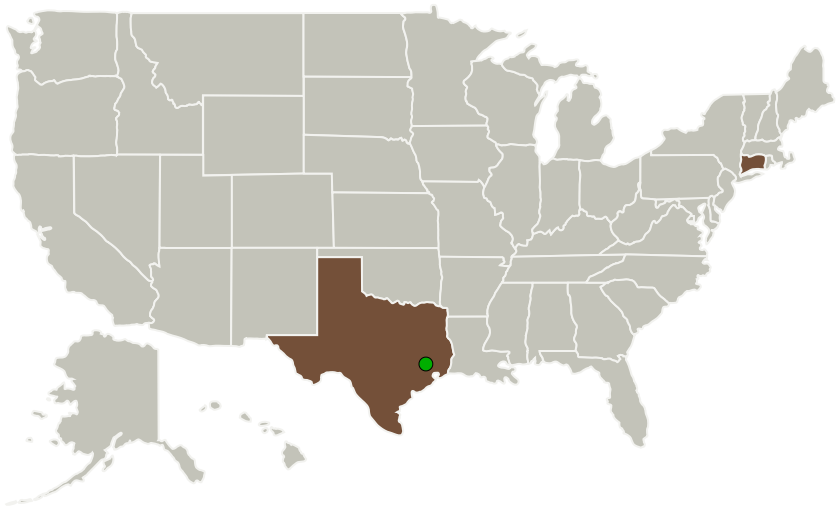
Variable Surface Area Thermal Radiator, Phase I

Completed Technology Project (2011 - 2011)

Project Introduction

Due to increased complexity of spacecraft and longer expected life, more sophisticated and complex thermal management schemes are needed that will be capable of dissipating a wide variety of heat loads under harsh operating conditions. An optimal thermal control system must effectively vary the amount of heat dissipation while at the same time not burdening the spacecraft by utilizing the extremely limited spacecraft resources, such as mass, volume, or power. Several previous thermal control systems have successfully utilized movable louver and pinwheel type designs for enabling thermal control. Each type of louver system has the drawback of utilizing moving parts that can break or bind, and only enable course thermal control. A much better approach would be to have a conformal, flexible type louver system. The CAC system implements a variable thermal control system that consists of a thin membrane (< 1mm) that is comprised of a plurality of small electrostaticly operated "louvers" that can be adjusted to varying degrees of inclination for variable heat rejection. The flexible electrostatic variable emissivity louver membrane is not only extremely lightweight, but also has the added benefit of being completely conformal to a spacecraft surface.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Connecticut Analytical Corporation	Lead Organization	Industry	Bethany, Connecticut
Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations	
Connecticut	Texas

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138560)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Connecticut Analytical Corporation

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Joseph Bango

Co-Investigator:

Joseph Bango

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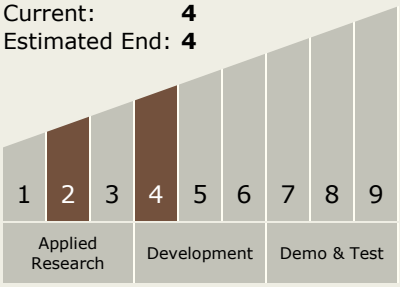
Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.2 Thermal Control Components and Systems
    - TX14.2.3 Heat Rejection and Storage

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System